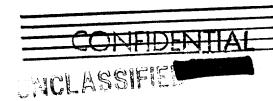
ChemRisk/Shonka Research Associates, Inc., Document Request Form

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DIVISION OF UNION CARBIDE NUCLEAR COMPANY



CORPORATION

POST OFFICE BOX P. OAK RIDGE, TENNESSEE

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November 19, 1963

KC-693

United States Atomic Energy Commission Post Office Box E Oak Ridge, Tennessee

> Attention: Mr. C. A. Keller, Director

Production Division

Gentlemen:



Attached is the information you requested on November 6 from Mr. A. de la Garza on the inventory requirements and usages of the major relatively heavy fluorocarbons utilized as coolants, lubricants, or plastics at the Oak Ridge Gaseous Diffusion Plant. The estimates of inventory requirements and usages were made by our Production Division from various historical sources, and the commentary was reviewed by our Technical Division.

We shall be pleased to provide you with further information you may require on this subject.

Very truly yours.

G. Jordan,

RGJ-AG: fw

cc:

Mr. C. A. Keller, USAEC (6)

Mr. A. P. Huber

Mr. D. M. Lang

Mr. J. P. Murray

Mr. K. E. Rapp, Jr.

Mr. G.T.E. Sheldon

Mr. S. S. Stief

Mr. R. A. Walker

Plant Records (RC)

File

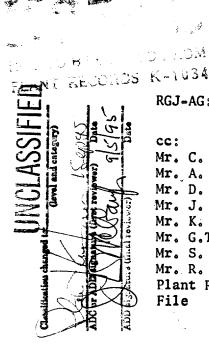
Union Carbide Nuclear Company, Oak Ridge Gaseous Diffusion Plant, Operating Contractor for the U.S. Atomic Energy Commission.

Oak Ridge Gaseous Diffusion Plant

This document has been approved for release to the public by:

Technical Information Officer

Oak Ridge K-25 Site



CLASSIFICATION CHANGE

by authority of: JD MCGAUGH JR 9/5/95

CG-PGD-4 Classification Specialist MMES

CG-PGD-4 Classifier's name and organization)

or

(Authorized Declassifier's name and organization)

or

(Official declass. notice memo, TIC notice, etc.)

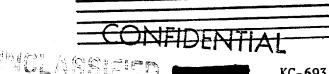
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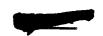
Table 1

DATA ON FLUOROCARBONS USED AT THE OAK RIDGE GASEOUS DIFFUSION PLANT

Item	Classi- fication	Formula	Molecular Weight	Year First Used	Process Inventory (Pounds)	Usage (Pounds Per Mo.)	Where Used
C-816	Coolant	C ₈ F ₁₆	400	1944	1,800,000	ſ4 000	K-25,27
C-437	Coolant	$C_4C1_3F_7$	287	1956	1,800,000	1 4,000	K-25,27
C-114	Coolant	$^{\mathrm{C_2^{\mathrm{Cl}}}_{2^{\mathrm{F}}_{4}}}$	170	1950	4,300,000	16,000	K-29,31,33
C-2144	Lubrican	t C ₂₁ F ₄₄	1088(ave.)	1944	See Commentary	70	K-25
MFL	Lubricant	c (CF ₂ =CFC1)	770(ave.)	1945	600	300	K-25,27,29,31,33
MFP	Plastic	$(CF_2=CFC1)_x$	300,000	1945	See Commentary	50	K-25,27,29,31,33
Teflon	Plastic	$(C_2F_4)_x$	High	1946	Commentary	25	K-25, 27, 29, 31, 33
C-716		^C 7, F ₁₆	388	1944	See Commentary	co es	K-25

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Commentary for Table 1

C-816: This was the process coolant of the original K-25 and K-27 plants. The original order in 1944 was for 2,250,000 lbs. It was made by both Hooker Electrochemical Company and Du Pont. About 1,800,000 lbs. were required to fill up the coolant systems in K-25 and K-27. Early usage was at the rate of about 7500 lbs. per month.

C-437: This process coolant was made on order when the C-816 stock on hand was running low (1956). It replaced the original C-816 and was made to be miscible with the C-816 already in use; the K-25 and K-27 plants today contain a mixture of C-816 and C-437 in their coolant systems. The Halocarbon Products Corporation made the needed supply of C-437.

The total present inventory of C-816 and C-437, both inside the K-25 and K-27 coolant systems and in storage, is about 2,100,000 lbs.

C-114: This process coolant is adapted to the evaporative type coolant systems in the newer axial plants, K-29, K-31, K-33. This material goes commercially under different names; it is Du Pont Freon-114, Carbide Ucon-114, Penn Salt Isotron-114, General Chemical Genetron-114.

The C-114 inventory of 4,300,000 lbs. in the coolant systems is broken down as follows:

K-33: 3,100,000 lbs.

K-31: 900,000 lbs.

K-29: 300,000 lbs.

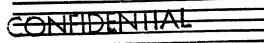
The total present inventory of C-114 is also close to 4,300,000 lbs. Since this material is quickly available in tank car lots from commercial suppliers, quantities in storage are held to a minimum.

C-2144: This was a lubricant of limited use on equipment with possible exposure to small amounts of UF, and F₂. It was mainly used on external moving parts of the pumps in the original purge buildings (K-312). The original order in 1944 was for 7,050 lbs., and by 1951, this supply was exhausted. MFL has been substituted for C-2144.

MFL: This is a generally used lubricant in the presence of severe exposure to UF₆, F₂, ClF₃. It finds process plant use in large mechanical vacuum pumps and gate valves. The original order in 1945 was for 12,000 lbs. This order was made on the basis of MFL use in cold trapping operations in K-25, but these operations were quickly curtailed. MFL is now available commercially under the names

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Minnesota Mining Kel-F No. 10, Halocarbon Products Corporation heavy oil 14-25, Hooker Electrochemical T-45.

MFP (also called P-10):

This is a plastic polymer made from a completely halogenated monomer for use in valve seats and gaskets having exposure to UF₆, F₂, ClF₃. It is now available from Minnesota Mining as one of the Kel-F plastics.

The plant requirements of the above plastics cannot be well ascertained. The original K-25 plant was equipped with rubber seated gate valves. Shortly after start-up, about a thousand of these valves, mainly unit valves ranging in size from 6" to 16" diameter, were equipped with P-10 seats. About 10,000 lbs. of P-10 were purchased at the time. However, during this early period, P-10 was also made locally, and it is believed that another 10,000 lbs. of P-10 were thus made. During these operations, in addition to the valve seats, a variety of beakers, tubing, flanges, etc., were made from P-10 in the local plastic shop to fill the needs of other AEC contractors, and the distribution of P-10 usage cannot be ascertained. Valves for the newer plants were purchased with P-10 seats already installed.

Teflon: This is another plastic with similar uses as MFP. It is a Du Pont product.

C-716: This was a liquid fluorocarbon material originally intended to serve as a hydrodynamic simulator of gaseous UF, for test purposes in the initial K-25 start-ups. About 46,500 lbs. were purchased. Actually, little use was made of it as originally intended. It later found use as a coolant in UF, separation pilot plants.

C-113: (Not included in Table I)

This is the original Du Pont Freon-113, now also available commercially from other sources. (See C-114.) It has been considered as a possible coolant for K-25 and K-27, and may find such use in the future.



